Human factors are closely linked to desertification; the excessive pasturing and cultivation that contribute to desertification are prompted by human factors, such as population growth and poverty. The question is how to generate new processes for the prevention of desertification, while maintaining the daily acts required for people’s lives and livelihoods. Awareness of these issues has prompted the implementation in West Africa of measures to prevent desertification. These measures and techniques are introduced here.
The degradation of land in drylands

The United Nations Convention to Combat Desertification (UNCCD) defines desertification as “land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.”

What is land degradation?

The UNCCD defines land degradation as the “reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation pattern, such as soil erosion caused by wind and/or water, deterioration of the physical, chemical and biological or economic properties of soil, and the long-term loss of natural vegetation.”

Desertification has a negative impact on all human society: the loss of food production infrastructure, in the form of land for agriculture and pasturage, is a contributing factor to increases in poverty, population movement toward urban areas, and a rise in refugees. Desertification results in problems in many different areas of human life: the environment, resources, health and hygiene, safety and security, and the socioeconomy. These problems are particularly severe in developing countries, on which the rest of the world is ecologically dependent for crops, food, daily items, and fuelwood, charcoal, and timber. For example, many African countries regularly experience severe drought. In the face of the degradation of their land, which is the food production infrastructure, people in affected areas are forced to excessively consume of natural resources, such as forestry and water, simply in order to survive. This accelerates the degradation of the land, triggering a vicious cycle.

Classification of Dryland

Drylands comprise 41.3% of the global terrestrial area in 2000.

Drylands are home to 34.7% of the global population in 2000.

Dryland Subtype Aridity index
Hyper-arid areas
Arid areas
Semi-arid areas
Dry sub-humid areas

Environmental impact
- Loss of habitat and biodiversity
- Reduced groundwater recharge, water quality and soil fertility
- Increased soil erosion, dust storms, and sand encroachment

Material needs
- Diminished farm and rangeland production
- Loss of biodiversity
- Water scarcity

Human health
- Malnutrition and hunger
- Water-borne diseases, respiratory problems

Safety
- Conflict over land and water resources
- Increasing flash floods, dust hazard

Socio-economic
- Poverty, marginalization, decreased social and economic resilience, population movements

Desertification: Consequential Issues

Global Environmental Outlook 4 (UNEP, 2007)

Drawn up from Millennium Ecosystem Assessment (2005)

Drylands Today

Home to a population of more than 2 billion
Support more than 50% of the world’s livestock
Origin of 30% of the world’s cultivated plants
The majority of dryland peoples are resident in developing countries
44% of all cultivated land is in drylands

Desertification: a visual synthesis (UNCCD, 2011)
Desertification is caused by two types of factors.

**Human factors:** resulting from human activity, such as overgrazing, overcutting, and overcultivation, which goes beyond the limits of the delicate ecosystems that exist in drylands. These activities cause a reduction in vegetation growth in the affected lands, accelerating the water and wind erosion that are the direct causes of desertification. These human factors are prompted by the wider socioeconomic context, including population growth, the development of market economies, and poverty. Desertification, therefore, is intimately linked to the lives of the people who reside in the affected regions.

**Climate factors:** e.g. global climate change, drought, and aridification due to overcultivation and overexploitation, which goes beyond the limits of the delicate ecosystems that exist in drylands. These activities cause a reduction in vegetation growth in the affected lands, accelerating the water and wind erosion that are the direct causes of desertification. These human factors are prompted by the wider socioeconomic context, including population growth, the development of market economies, and poverty. Desertification, therefore, is intimately linked to the lives of the people who reside in the affected regions.

### Convention Objectives and Achievement Levels

In 2010, an evaluation was conducted to establish the extent to which the objectives of the Convention had been achieved. The results indicated that while there has been considerable success in advocacy and education—growing awareness and understanding about desertification and land degradation—there has been little such progress in the formulation and implementation of National Action Programmes in affected countries or in the integration of investment frameworks. Further measures are required to promote greater achievement in these areas.

<table>
<thead>
<tr>
<th>Operational objective</th>
<th>Performance indicator</th>
<th>Overall target</th>
<th>Current achievement level</th>
<th>Target due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy, awareness and education</td>
<td>Information and awareness</td>
<td>30% of global population informed about desertification, land degradation and drought and/or synergies with climate change and biodiversity</td>
<td>25%</td>
<td>2018</td>
</tr>
<tr>
<td>Policy framework</td>
<td>National action plan alignment</td>
<td>80% of affected country Parties with a formulated/revised national action plan aligned to the 2008-2018 Strategic Plan</td>
<td>5%</td>
<td>2014</td>
</tr>
<tr>
<td>Science, technology knowledge</td>
<td>Joint planning of the &quot;Rio conventions&quot;</td>
<td>100% of affected country Parties with joint national action plans in place or functional mechanisms to ensure synergies between the three Rio conventions</td>
<td>72%</td>
<td>2014</td>
</tr>
<tr>
<td>Capacity building</td>
<td>Dryland capacity-building</td>
<td>90% of affected country Parties implementing integrated action frameworks in place or functional mechanisms to ensure synergies between the three Rio conventions</td>
<td>71%</td>
<td>2014</td>
</tr>
<tr>
<td>Finance and technology transfer</td>
<td>Integrated action frameworks</td>
<td>50% of affected country Parties with integrated action frameworks in place or functional mechanisms to ensure synergies between the three Rio conventions</td>
<td>15%</td>
<td>2014</td>
</tr>
</tbody>
</table>

### Human factors

- **Overgrazing**
  - Livestock near water (Burkina Faso)
- **Overcultivation and overexploitation**
  - Careaing timber (Burkina Faso)

### Land erosion and degradation

Land erosion is caused when precipitation and surface water run-off washes away soil. At first, the tills are washed away evenly over wide areas, in what is known as sheet erosion. The next stage is rill erosion, in which small channels, known as rills, form. These rills eventually broaden and deepen, forming V-shaped gullies; this stage is known as gully erosion. Water erosion removes fertile soil from the land, degrading its quality. This makes vegetation recovery a considerable challenge, therefore causing a decline in agricultural productivity. The result is a reduction in cultivated land area.

### Wind erosion

Surface wind causes soil dispersion and movement. The fertile top layers of soil are dispersed by wind, making it harder to grow plants.

**Chemical degradation and physical degradation**

Chemical degradation includes salt build-up, lack of nutrients, acidification, and contamination by chemical substances. Salt build-up caused by a lack of suitable irrigation is a severe problem in many areas of the world. Physical degradation refers to the compaction and hard-setting of the top layers of soil.

### Organization of the Convention

The Conference of the Parties (COP) is established on a regular basis by the Convention as the Policy Framework (CST), intended to focus on science and technology and provide relevant policy advice, and the Committee for the Review of the Implementation of the Convention (CRIC), intended to conduct regular reviews of the implementation status of the Convention.
Water Erosion in Africa: How We Can Help

The impact of climate change can lead to torrential rainfall causing flooding, even in drylands. In areas already affected by agricultural land expansion and deforestation, such flooding accelerates the progress of water erosion. The Ministry of the Environment has conducted research on the current state of water erosion and what measures are being put in place to prevent any worsening of the already severe impact water erosion has on the lives and livelihoods of people in affected areas.

Morocco (Chefchaounen area)

Water erosion in the area of Chefchaounen has been accelerated through deforestation to create new land for cultivation and a shift toward using land to plant olive orchards.

- Areas of severe water erosion in Chefchaounen
- Areas with severe water erosion since 1980s
- Areas with improved/progessive severe water erosion since 2000s
- Areas with no-severe water erosion since 1980s

Burkina Faso (Southwestern district)

The southeastern area of Burkina Faso experiences considerable population influx from external regions. As a result, there has been considerable expansion of agricultural land, used to produce cotton and food, as well as gold in the development. This has caused a reduction in forested land in the area. Although annual rainfall precipitation levels are in decline, woodland and forest cover has become increasingly frequent in recent years, making the land even more susceptible to water erosion.

- Areas of severe water erosion in Burkina Faso
- Areas with severe water erosion since 1980s
- Areas with improved/progessive severe water erosion since 2000s
- Areas with no-severe water erosion since 1980s

Ethiopia (Nazret region)

Climatic factors, such as torrential rainfall, have combined with population growth in the Nazret region of Ethiopia to create a situation in which cultivated land cannot be left fallow. Instead, livestock are set to graze on overcultivated land, accelerating the rate of water erosion.

- Areas of severe water erosion in Nazret
- Areas with severe water erosion since 1980s
- Areas with improved/progessive severe water erosion since 2000s
- Areas with no-severe water erosion since 1980s

Combating Desertification through International Cooperation: Locally-based Measures for Chefchaounen

- Monitoring systems that involve local people are required as a way of indicating to the local community that specific measures are in place; this is in addition to monitoring over wide areas.
- Greater support for the identification and sharing of local knowledge, traditions and techniques that have proved effective in combating desertification. Knowledge and techniques will differ according to region and country but may be applicable elsewhere.
- Introduction to the people involved in combating desertification at the local level to the scientific mechanisms of desertification and effective anti-desertification techniques. Provision of the necessary technical training to be able to apply such knowledge and techniques.
- Long-term, continuous support; the effects of anti-desertification measures will be immediate.

Combating Desertification through International Cooperation: Locally-based Measures for Southwest Burkina Faso

- Dissemination throughout local communities of information about combating desertification (language differences and poor literacy are posing information on desertification from being more widely shared).
- Greater support for the investment, materials and technology required to facilitate the transfer of anti-desertification technology.
- Greater support for information sharing on conventional technologies from other areas that have proved effective in combating desertification.
- Implementation of effective support for information sharing and exchange among supporting countries and organizations, through the promotion of further collaboration.

Combating Desertification through International Cooperation: Locally-based Measures for Ethiopia

- Promotion of surveys and research on anti-desertification techniques and technology that can be integrated into daily life.
- Greater support for the investment and technology required to facilitate the transfer and popularization of anti-desertification technology; greater cooperation towards the promotion of model projects designed to showcase positive results to local communities.
- Promotion of information sharing among researchers to encourage a more integrated, cross-disciplinary approach to the development of measures to combat desertification (e.g. promotion of research from the perspective of natural resources management).
- Greater support for information sharing on conventional technologies from other areas that have proved effective in combating desertification.
Inter-regional Transfer for Traditional Technology to Combat Desertification

Desertification caused by human factors, such as overcultivation, overgrazing and overcutting, must be viewed in the wider socio-economic context, including population growth, the development of market economies, and poverty; desertification is intimately linked to the lives of the people who reside in the affected regions. This project focused on the identification of traditional knowledge and technology, originating in surrounding areas, which could meaningfully be applied to the affected regions.

This anti-desertification technology was then introduced to the affected region, with a focus on encouraging local people to take charge of the project.

**Background**

The seventh session of the Conference of the Parties (COP7) encouraged development countries to provide support based on the promotion of traditional knowledge in Africa.

**Project location**

The project was implemented in Takabangou village in Burkina Faso.

**Project Outline**

Traditional knowledge, technology, and know-how, originated in the surrounding regions and with proven results in combating desertification, was identified and introduced to the local community. Workshops and opportunities to observe the technology in practice were held in order to allow the local community to select which technologies they would like to acquire. Training was then conducted to enable local people to acquire and implement the technology; local people were encouraged to be the main actors in the process of popularizing and encouraging the acceptance of the new technology.

**Technology Transfer: Outline of Results, Successes and Challenges**

1. Two traditional practices were introduced through this project:
   1. Diguettes, used in the surrounding regions to prevent water erosion, and
   2. Zai, a traditional method of ensuring the efficient utilization of water and organic material. Of these, the cost of the tool required to dig zai was very low, making it a highly accessible option in any context.

2. The impact of zai and diguettes on yield (in addition to any anti-desertification effect) was quick to be noticed, and there was widespread introduction of zai among both men and women in the local community. Approximately 250 local people purchased the tool required to dig zai.

3. The cost and labor required to transport the stones needed to construct diguettes were an obstacle to individual attempts to introduce the practice.

**Technology chosen by local people and its effects**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Group formation</th>
<th>Population the technology capable of recovering degraded land</th>
<th>Secure the time required to secure degraded land</th>
<th>Secure the funds required to purchase the equipment and manage needed to recover degraded land</th>
<th>Forge relations (particularly among women who will allow women to continue)</th>
</tr>
</thead>
</table>
| Zai        | Zai is a traditional technique used during the dry season. Holes, called zai, of around 30cm in diameter are dug across the land on which crops are to be cultivated. They may then be filled with a mix of fertilizer (manure). Digging the holes improves water retention, and the benefits of crop growth even in times of scarce precipitation.
| Diguettes  | The diguette technique involves building lines of stones along contour lines. It is designed to prevent topsoil being flushed away by rainfall. Lines can be built at intervals across the land, helping to stem the momentum of water flow. It is not a difficult technique, but requires a considerable amount of stones; consideration must be given, therefore, to the procurement and transportation of stones for building diguettes. |

**Support for the inter-regional transfer of traditional technology to combat desertification**

In order to verify and evaluate the effects of transferred technology, the project initially commissioned test groups to introduce the target technology, then share their results with the entire region. This approach was chosen to encourage local people to assess the benefits of the target technology as well as the progress of project activities. Japanese and local NGOs provided support in coordinating and managing the project, enabling detailed follow-up of community activities.

**Technology Transfer**

The project also focused on the introduction of technology making use of animal draught power to reduce the burden of tillage and weed removal. In accordance with suggestions from the test groups, areas prepared using animal draught power were separated from “control” areas, where the land was prepared conventionally by hand. The results of the test period indicated that use of animals had a negative impact on sandy areas, so draught power continued to be used on land with clay soil.

**Drained Animal Technology**

The project aimed to popularize and encourage the acceptance of the new technology, with the potential to facilitate issue resolution (particularly among women) and to transfer in relevant amendments to suit the conditions of the target region, with appropriate support and the promotion of the target region, anti-erosion, especially involving cooperation and exchange through field development of local community dialogue. The project has been successful in identifying how people's priorities and other technologies with the potential to combat desertification.

**Support**

<table>
<thead>
<tr>
<th>Local coordination</th>
<th>Action for Greening Sahel (Japanese NGO active in local region)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local follow-up</td>
<td>Oubangui Sheep Association (local NGO)</td>
</tr>
<tr>
<td>Project monitor</td>
<td>Ministry of the Environment, Japan</td>
</tr>
<tr>
<td>Project timeframe</td>
<td>FY2004-2007</td>
</tr>
</tbody>
</table>
Ministry of the Environment: Our Efforts

Inter-regional Transfer for Traditional Technology to Combat Desertification

3 Textile production technology
Textile production technology provides an opportunity to increase income during the dry season without reliance on the land. With a focus on young women in the local community, the project oversaw the introduction of sewing machines.

- Improvements to income through a variety of order-based sales models
- The machine itself is an expensive investment, creating an obstacle to popularization outside of test groups

4 Soap production technology
Soap production technology also provides the opportunity to boost income during the dry season without reliance on the land. The project oversaw the introduction of soap production technology to women-only test groups.

- Improvements to income through regular soap production and sales
- Creation of problem-solving network through collaboration with neighboring organization engaged in similar activities. The test groups also proved to be drivers of innovation, supporting the introduction of zai and diguettes techniques.
- Resistance to new participants as a potential threat to established group coherence (although enthusiastic in introducing technology to others)

Lessons Learned and Recommendations

1 The purpose of introducing appropriate agricultural technology is not about alleviating pressure on the land; it is also about creating income sources that are not reliant on the land (e.g., soap, textiles). Measures designed to improve poverty and build capacity are also vital. Encouraging the local community to understand and select the technology to be introduced through traditional decision-making processes in the region is crucial in order to secure community independence in project implementation.

2 Any decision on whether to discontinue, continue or expand the transfer of a particular technology should be based on the verification and evaluation of the activities of test groups, who use the proposed technology in advance of the rest of the community. Activities that have produced positive results still need to be promoted in order to facilitate expansion into the wider community, and the groups that preliminarily test the technology have a tendency to try and exclude other would-be local participants. It is vital to implement a framework that will prevent the monopolization of benefits or technology by a limited group within the community.

3 Depending on land conditions, such as gradient, vegetation and soil, the technology introduced will not necessarily have the same impact as it does in other areas. Differences in socioeconomic context may also cause issues that affect the introduction of technology. It is crucial that the technology introduced is adapted and applied appropriately in accordance with the physical and socioeconomic conditions of the target land and region. The task is to indicate what possibilities there are for adaptation and application.

4 It is difficult for external support organizations to set up base in target regions and provide permanent support. In order to ensure that support is sustainable, there is a need to collaborate with support organizations (including local NGOs) active in the region and to work to establish support as part of central and/or local government policy. The institutionalization of activities and training for technology transfer is key here.

Project Outline

Promoting and Popularizing Water Erosion Prevention Measures Combining Traditional Knowledge and Resources

The project conducted in Burkina Faso highlighted how the popularization of diguettes, a traditional technology with proven efficacy against water erosion, was hampered by the transportation costs of the stones required and the intensive demand for labor—these factors worked to prevent local people from being able to introduce the technology on their own land. The introduction of a financial incentive to grow Andropogon spp., a type of prairie grass indigenous to the region, was designed to overcome this issue, and to aid the popularization and acceptance of diguettes as a water erosion technique.

Technological Sucesses

- Promotion of Andropogon spp. growth through a combination of diguettes and zai
- Diguettes serve to alleviate the effects of water erosion, but the costs involved—such as arranging for trucks to transport stones—can be prohibitive

Changes in Local Producer Behavior

- Developing Technology Involving Unique Local Resources
  - Workshops introducing the technology outlined above were held in order to encourage local people to implement locally-devised measures enabling them to access local resources and technology.

- Andropogon spp. (Poaceae: Andropogoneae) is a herbaceous perennial that grows in the tropical and subtropical savannahs of Africa.
- Andropogon spp. is used as livestock feed and as construction material for homes and grain stores; it is an important source of cash-based income for households.
- It is often found on cultivated land in West Africa and in the Sahel region (200mm-600mm annual precipitation, located to the south of the Sahara Desert).

More Info

Research into Appropriate Promotion Methods for Technology to Combat Desertification / FY2010-2011 / Ministry of the Environment (conducted jointly with Action for Greening Sahel, Research Institute for Humanity and Nature)

Target areas: Tillaberi Region, Niger
- Target area moved to Niger as a result of political turbulence in Burkina Faso

Decision-making processes in Takabangu village:
- In Takabangu village, after meeting for prayer at the mosque, meetings will be held in which all villagers can take part. These village meetings are influenced by an external village hierarchy based on age, whereas women, in principle, are not participants in the decision-making process. For the sake of this research, in addition to the village assemblies held as part of the project, women-only assemblies were held in three areas of the village. In the traditional decision-making village forums, villagers were selected to take part in assemblies and observances based on their ability to give a full and proper account of any assembly or observance attended. In the same way, the participants from the women-only groups were selected based on the recommendations of appropriate persons. Rational decision-making processes were observed in both types of group.
The “Fallow Band System” is designed to simultaneously control wind erosion and improve crop yield. It is a technology particularly suited to West Africa, where local people are lacking in both labor resources and the funds to buy materials or pay running costs, since it requires none of these. The technology was conceptualized by a team at Kyoto University, and was then subject to a period of international research, conducted by a joint team (Japan International Research Center for Agricultural Sciences (JIRCAS), Kyoto University, West and Central Africa Office of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in which its efficacy in preventing wind erosion and improving grain yield was verified. The Japan International Cooperation Agency (JICA) and the Global Environmental Forum NGO were also project collaborators, working to promote the technology throughout local communities.

The Fallow Band System, developed by the Kyoto University-led team of researchers, then took their research findings into the field, with the aim of testing the system in 40 villages in west Niger. Field testing was conducted as grassroot-Type project in partnership with the Japan International Cooperation Agency (JICA).

### Activity Outline

Testing of the Fallow Band System, designed to prevent desertification (particularly wind erosion) and improve agricultural productivity, took place in the field over a three year period, between April 2010 and March 2013. Testing was conducted in two states located near Niger’s capital city, Niamey. The project was run in partnership with a local NGO, Organisation Niégrienne des Éducateurs Novateurs (ONEN), which helped to introduce the technology to a total of 42 villages, instructing local people who took an interest in the technology. Once the system had been introduced by a few farmers, the next stage was to make others aware of the positive results that had been achieved by early adopters. Focusing on regional areas, members of ONEN, Japan Overseas Cooperation Volunteers, and the Loga department agricultural bureau worked together to introduce the Fallow Band System to 89 villages in total.

### Outline and Features of the Fallow Band System

1. **During the rainy season,** 5m-wide fallow bands are arranged at a right angle to the direction of erosive winds (eastern wind) in cultivated fields. The fallow bands can be created by omitting usual seeding and weeding; they will be naturally formed by weeds and therefore do not require any additional economic or labor input from farmers.

2. **During the dry season,** after crop harvest, the fallow bands serve as efficient traps for wind-blown soil and coarse organic matter such as plant residues.

3. **In the subsequent rainy season,** the fallow bands are shifted to the direction of erosive winds. Areas which served as fallow bands the previous year can now be cultivated.

4. **Stages 1 and 2 are iterated.**

### Increased yield

![Increased yield graph](image)

**Millet grown on land left fallow the previous year**

*Proportional increase in yield for whole cultivated land (%)*

- Number of years since Fallow Band System was introduced (year)

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11%</td>
<td>12%</td>
<td>75%</td>
<td></td>
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</tr>
<tr>
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<td>54%</td>
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<tr>
<td>3-4</td>
<td>75%</td>
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</tbody>
</table>

Japanese Efforts in West Africa:
Organizations Combating Desertification

An outline of activities focused on combating desertification being conducted by Japanese organizations in West Africa.

West African activity history of the organizations introduced here

<table>
<thead>
<tr>
<th>Year</th>
<th>JICA</th>
<th>Research Institute for Humanity and Nature, Kyoto University</th>
<th>JIRCAS</th>
<th>Center for Forestry and Agriculture Development</th>
<th>Action for greening Sahel</th>
<th>Ministry of the Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td></td>
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<td>2</td>
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<tr>
<td>2000</td>
<td>3</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>4</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Capacity improvement for land degradation (FY2001-2016, Senegal)
3. Conception, development and testing of anti-desertification technology with strong affinity with local lives and livelihoods (FY1994 onwards, Burkina Faso, Niger, etc.)
5. Fighting desertification and improving livelihoods (FY2003-2014, Burkina Faso)
7. Starting research into desertification (FY1998, 5 African countries)
8. Compilation of Technical Guides to Combat Desertification in Sahel Region (FY2001)
9. Beginning of activities (FY1995, Chad)
10. Fighting erosion and improving livelihoods (FY2009-2014, Burkina Faso)

*The Center for Forestry and Agriculture Development was abolished in 2008, and the international department absorbed into JIRCAS.

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Research Institute for Humanity and Nature

Project name: Human Subsistence Ecosystems in Arab Societies
Partner organizations: Kyoto University, Tokyo Metropolitan University, Global Environmental Forum, etc.
Target countries: Niger, Burkina Faso, Namibia, Zambia, India, Sudan, Mongolia, etc.
Period: FY2007-2016 (provisional)
Objective: Understanding the societies and climates of regions experiencing desertification; development and verification of coping strategies (e.g. tolerating land systems, technology for the simultaneous control of soil erosion and livelihood improvement through the growth of Andropogon spp., etc.); and the provision of technology-based suggestions and advice to projects run by JICA, NGOs and the Ministry of the Environment.
Activity outline: Including measures underway prior to project launch, the research institute has been involved in: the re-examination and re-application of traditional knowledge; the conceptualization, development and verification of coping strategies (e.g. tolerant land systems, technology for the simultaneous control of soil erosion and livelihood improvement through the growth of Andropogon spp., etc.); and the provision of technology-based suggestions and advice to projects run by JICA, NGOs and the Ministry of the Environment.

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Japan International Research Center for Agricultural Sciences (JIRCAS)

Project name: Development of technologies for sustainable agricultural production in the African savannah (environment and natural resource management program)
Target countries: Ghana, Burkina Faso
Period: April 2011-March 2016 (provisional)
Objective: Reduce surface run-off of precipitation, achieve more efficient use of precipitation, and realize better soil conservation, while facilitating the stable improvement of agricultural productivity.
Activity outline: Based on the following three concepts, verify and promote agricultural technology in the target regions: Seeding without tilling, or with only partial tilling, in order to cause minimal damage to the land; Using crop residue and organic substances to create surface mulch; Making use of diverse cropping systems (intercropping, crop rotation, relay cropping, etc.)

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Action for Greening Sahel

Project name: Project of Capacity Building for the Restoration and the Promotion of Effective Use of Degraded Soil in the Area of Soil Degradation
Target country: Senegal
Period: March 2011-March 2016 (provisional)
Objective: Build capacity among relevant parties in order to control land degradation and promote effective land use
Activity outline: Promotion and popularization of capacity building among relevant parties in 100 priority villages in Senegal, enabling them to use technology for control land degradation and to promote effective land use. At present, efforts are focused on verification test of technological improvements and developments, geared toward the control of the land degradation as result of water erosion, wind erosion, and chemical factors. The project adopted the relatively low-cost technology which has already been succeeded in the countries surrounding the Sahel (e.g. diguette, contour line planting, fertilizer production). In addition, the project tries to utilize the “Fallow Band System” being developed for Niger by Kyoto University. In this way, the cooperation is being provided, backed up by the verified research.

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Project name: Environmentally friendly measures to improve agricultural productivity in the areas surrounding Lake Bam (Grassroots-type project in partnership with JICA)
Target country: Burkina Faso
Period: Jul 2009-Jun 2014 (provisional)
Objective: prevent water erosion-related decline of soil fertility; improve productivity through the efficient use of natural resources including the surrounding areas
Activity outline: The Kongoussi region, in central Burkina Faso, suffers from chronic food shortages. This project aims to prevent further declines in soil fertility through the use of diguette and Andropogon spp. to improve soil fertility with zai systems and fertilizer. The same methods will be used to recover degraded land, thereby increasing the total area of cultivable land in the region and enhancing food production levels. Measures will also focus on improving cash-crop production through beekeeping and the raising and breeding of livestock, and on instilling in local population an awareness of the importance of environmental conservation.